

Effect of exercise therapy on displacement of the center of rotation of lumbar vertebrae in patients with non-specific chronic low back pain

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*Abstract

Background: The center of rotation (COR) of the lumbar vertebrae is one of the important characteristics in evaluation of lumbar spine kinematics.

Objective: The aim of this study was to investigate the effect of exercise therapy on displacement of the COR of lumbar vertebrae in patients with non-specific chronic low back pain.

Methods: This interventional study was conducted in 30 patients with non-specific chronic low back pain referred to Shahid Beheshti hospital in Babol, 2012. The patients were randomly assigned to two equal groups. For 8 weeks, the patients in the intervention group performed routine plus stabilization exercises while the patients in the control group performed only routine exercises. Radiographic examination was performed in flexion, extension, and neutral views before and after the treatment and the followings were compared: the COR of each lumbar vertebra in global state (rotation of each vertebra relative to the sacrum) and relative state (rotation of each vertebra relative to the lower vertebra) and in full flexion-extension, flexion, and extension arcs. Data were analyzed using paired T-test and independent sample T-test.

Findings: After treatment, the mean difference of the COR of the lumbar vertebrae was only significantly different between the two groups for relative measurement in L3 on y-axis in full flexion-extension arc. In flexion arc, the mean difference of the displacement of the COR was significantly different between the two groups for global measurement in L3 and L5 on y-axis and for relative measurement in L5 on y-axis. In extension arc, the mean difference of the COR of the lumbar vertebrae was not significantly different between the two groups for both global and relative measurements.

Conclusion: With regards to the results, it is suggested to consider the displacement of the COR as an objective index in order to evaluate the effect of stabilization exercises.

Keywords: Exercise Therapy, Rotation, Low Back Pain, Lumbar Vertebrae

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